

Abstract

A beacon beam is transmitted from a receiver to a transmitter. The transmitter generates and transmits a conjugate beacon beam back to the receiver, where it is interfered with a local oscillator beam to form a hologram. The hologram is used to configure a spatial light modulator as a diffraction grating. A conjugate communications laser beam containing information is subsequently transmitted to the receiver. The diffraction grating deflects the conjugate communications beam to a fixed and known direction, whereupon it is directed through a spatial filter.

Since the direction of the conjugate communications beam is fixed and known, the diameter of the filter aperture can be minimized to accept the communications beam while rejecting almost all of the background light. A high-speed detector directly detects the filtered conjugate communications beam. The detector output is transmitted to a demodulator that extracts the information carried by the communications beam.